JUSTIFICATION FOR OTHER THAN FULL AND OPEN COMPETITION (JOFOC)
(In accordance with Federal Acquisition Regulation (FAR) 6.3 – Other than Full and Open Competition)

1. **This document is a justification for other than full and open competition prepared by NASA's Goddard Space Flight Center (NASA's GSFC) for continued development and operation of the NASA Mark IV and Next Generation Very Long Baseline Interferometry (VLBI) systems.**

   It is recommended that NASA's GSFC negotiate only with Massachusetts Institute of Technology (MIT)/Haystack Observatory (HO) for continued development and operation of the NASA Mark IV and Next Generation VLBI systems. This is a follow-on effort to existing Cost No Fee contract NNG10HP00C with MIT/HO. The goals of this proposed activity are to study the shape of the earth and how it rotates. Under this new contract effort, the Contractor shall provide the continued development and operation of the NASA Mark IV and Next Generation VLBI systems that are located at the HO facility. This work effort shall carry out VLBI operations and design and fabricate special VLBI hardware and software. Formal reviews of this work may occur at either the Contractor's facility or at NASA's facility.

2. **The nature and/or description of the action being approved:**

   The action being approved is for the operation of the NASA Mark IV data acquisition and correlator systems that are located at MIT/HO, and continued development of Next Generation VLBI systems by supporting the following specific areas:

   - VLBI correlator operations and sustaining engineering services;
   - VLBI field station operations and sustaining engineering services;
   - VLBI research and development for VLBI hardware and instrumentation and improvement of VLBI technique;
   - VLBI upgrades and Next Generation NASA VLBI systems at existing and new Space Geodesy Project (SGP) stations;
   - VLBI program management support

3. **Description of the supplies or services required, including an estimated value:**

   This requirement shall continue the development and refinement of the correlation and fringe processing programs that have been developed. Specifically, MIT shall continue to upgrade the correlation software and convert software for computer cluster use. MIT will contribute to the analytical development and software for improving the basic geodetic accuracy of the VLBI technique. MIT shall also assist the SGP in carrying out operational data acquisition and reduction tasks using the HO antenna and correlator. MIT shall be tasked to provide support for the installation, testing, and check-out of Next Generation VLBI systems at new SGP VLBI stations and upgrade systems at existing stations, as well as to fabricate and perform on-site acceptance testing of VLBI signal

chains and related hardware. The goal of the NASA space geodetic program is to achieve improvements in accuracy in the terrestrial reference frame. A major effort by MIT at HO shall be the understanding and reduction of both geophysical and systematic error sources. MIT will be requested to provide program support in such activities as participation in SGP science team meetings, SGP program meetings in technical and scientific areas bearing on the SGP, and performing studies in technical and scientific areas bearing on the SGP in VLBI, antennas and Ethernet technologies.

The correlator is connected to the HO antenna and MIT provides operation of the antenna and engineering support for the NASA's operated antennas. MIT developed the antenna's data acquisition hardware and much of the hardware used on the geodetic antennas in support of the NASA's SGP. The correlator was designed by MIT for NASA's GSFC. The HO is part of a worldwide system of VLBI stations for which NASA recognizes the need for further development and improvement to be accomplished under this contract.

The estimated value of this five year effort is approximately [redacted]. The period of performance will be from December 22, 2014, through December 21, 2019.

4. Statutory authority permitting other than full and open competition:

The statutory authority permitting other than full and open competition 10 U.S.C.2304(c)(1) only one responsible source.

5. A demonstration that the proposed contractor's unique qualifications or the nature of the acquisition requires use of the authority cited:

Based on market research conducted and the knowledge acquired by the NASA's SGP, no other firms were found capable of meeting the minimum requirements for continued development and operation of the NASA Mark IV and Next Generation VLBI systems. MIT is the only known source for acceptable supplies or services.

The HO is part of a worldwide system of VLBI stations. The highly specialized scientific community associated with this program has identified MIT's HO as the facility to carry on the decades of participation in the international geodetic VLBI program.

Antennas utilized for this effort belong to MIT. The next-generation correlator is identified as a component to be matched to MIT's existing equipment. The materials/service must be compatible in all aspects (form, fit and function) with the existing MIT HO systems presently installed and in use. MIT is the only organization with a correlator which is actively developing software and procedures for the operational correlation of geodetic data. MIT also provides synergy between geodetic and astronomical VLBI.

Only MIT has the experience, facility and equipment necessary to accomplish all aspects of the requirements of this contract. MIT was originally awarded a contract for this effort

on a non-competitive basis in the 1970's and has been awarded non-competitive follow-on contracts since then for continued development and operation of these VLBI systems.

For these reasons, no other source other than MIT can be utilized to obtain the needed supplies or services.

6. **Description of the efforts made to ensure that offers are solicited from as many potential sources as practicable, including whether a notice was or will be publicized as required by Federal Acquisition Regulation (FAR) 5.2:**

This procurement was synopsized on the NASA Internet Acquisition Service (NAIS) and Federal Business Opportunities (FedBizOpps) websites on August 5, 2014, with a response due date for capability statements of August 20, 2014, as required by FAR Part 5. The synopsis notified all interested sources that this requirement will be issued on a sole source basis and provided them an opportunity to submit their interest and capabilities.

7. **A determination by the contracting officer that the anticipated cost to the Government will be fair and reasonable:**

The proposed costs will be evaluated by the Contracting Officer's Representative and the Contracting Officer to determine that the labor rates, hours, skill mix, other direct costs, indirect costs, and fee are fair and reasonable. This may also include support from external organizations such as the Defense Contract Audit Agency, as needed.

8. **Description of the market research conducted and the results, or a statement of the reasons market research was not conducted:**

A Request for Information (RFI) was posted on April 16, 2014, soliciting information about NASA GSFC's intent to negotiate with MIT/HO for the subject requirements with the opportunity for potential sources to respond. One company expressed interest and provided its capability statement; however, a technical evaluation of the information submitted concluded that none of the aspects of the VLBI program described in the RFI were actually addressed. It was also concluded that the company lacked the experience and specialized resources necessary for the VLBI program.

The current knowledge of the end-user was also considered. The end-user is highly familiar with the international geodetic VLBI program which has worldwide knowledge of industry, educational and governmental organizations participating in this field, and identifies all sources accepted into the program. Only MIT has been identified in this arena.

In accordance with requirements of FAR Part 5, a notice of NASA's intent to issue a non-competitive procurement was synopsized on the NAIS and the FedBizOpps websites on August 5, 2014.

9. Other facts supporting the use of other than full and open competition:

MIT/HO has more than 40 years of experience in this area. Utilizing another source would be a duplication of effort that would result in excessive schedules and costs to the Government.

10. Sources, if any, that expressed an interest, in writing, in the acquisition:

In accordance with requirements of FAR 5.203(a), a notice of NASA's intent to award a follow-on sole source contract was synopsized on the NAIS and on the FedBizOpps websites on August 5, 2014. The synopsis notified all interested sources that this requirement will be issued on a sole source basis and provided them an opportunity to submit their interest and capabilities. One company, ADC, Inc., expressed interest. ADA, Inc. was found technically incapable and was informed accordingly. No other sources expressed an interest in the requirement.

11. The actions the Agency may take to remove or overcome any barriers to competition before any subsequent acquisition for the supplies or services required:

The Agency is unaware of steps that may be taken to overcome MIT's more than 40 years of experience as well as unique facilities and equipment in the area of VLBI research and development activities.

JOFOC Signature Page for of the NASA Mark IV and Next Generation Very Long Baseline Interferometry (VLBI) systems

TECHNICAL DIRECTORATE:

I certify that the facts presented in this justification are accurate and complete.

Signature 7/30/14 Date

CONTRACTING OFFICER:

I certify that this justification is accurate and complete to the best of my knowledge and belief.

Signature 7/31/14 Date

for PROCUREMENT OFFICER: (CONCURRENCE)

Signature 9/16/14 Date

GSFC COMPETITION ADVOCATE: (APPROVAL)

Signature 9/17/14 Date